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CLAIMS

- 1. A plant containing a recombinant nucleic acid construct, said construct comprising at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-12 fatty acid desaturase gene and wherein said construct confers altered fatty acid composition in seeds of said plant.
 - 2. The plant of Claim 1, wherein said construct comprises a full-length coding sequence of said mutant gene.
 - 3. The plant of Claim 1, wherein the plant is a Brassica canola plant.
- The plant of Claim 3, wherein said altered fatty acid composition comprises from about 1.0% to about 10.0% linoleic acid, based on total fatty acid composition.
 - 5. The plant of Claim 1, wherein said altered fatty acid composition comprises from about 69% to about 90% oleic acid, based on total fatty acid composition.
 - 6. The plant of Claim 1, wherein said mutant desaturase gene encodes a microsomal gene product.
 - 7. The plant of Claim 1, wherein said mutant desaturase gene comprises a non-conservative amino acid substitution.
- 8. The plant of Claim 7, wherein said mutant 25 desaturase gene comprises the sequence His-Lys-Cys-Gly-His.
 - 9. The plant of Claim 1, wherein said mutant desaturase gene is from a Brassica napus plant.
- 20. A plant containing a recombinant nucleic acid construct, said construct comprising at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-15 fatty acid desaturase gene and wherein said construct confers altered fatty acid composition in seeds of said plant.
- 35 11. The plant of Claim 10 wherein the plant is a Brassica canola plant.

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- 12. The plant of Claim 10, wherein said construct comprises a full-length coding sequence of said mutant gene.
- 13. The plant of Claim 11, wherein said altered fatty acid composition comprises from about 1% to 10% α -linolenic acid, based on total fatty acid composition.
- 14. The plant of Claim 10, wherein said mutant desaturase gene encodes a microsomal gene product.
- 15. The plant of Claim 10, wherein said mutant desaturase gene comprises a non-conservative amino acid substitution.
 - 16. The plant of Claim 15, wherein said mutant desaturase gene comprises the sequence His-Lys-Cys-Gly-His.
 - 17. The plant of Claim 10, wherein said mutant desaturase gene is from a Brassica napus plant.
 - 18. A plant containing one or more recombinant nucleic acid constructs, said one or more constructs comprising:
 - a) at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-12 fatty acid desaturase gene; and
 - b) at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-15 fatty acid desaturase gene,

said mutant delta-12 and mutant delta-15 desaturase genes conferring altered fatty acid composition in seeds of said plant.

- 30 19. The plant of Claim 18 wherein the plant is a Brassica canola plant.
 - 20. The plant of Claim 18, wherein said construct comprises a full-length coding sequence of said mutant delta-12 fatty acid desaturase gene.
 - 21. The plant of Claim 18, wherein said construct comprises a full-length coding sequenc of said mutant delta-15 fatty acid desaturase gene.

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- 22. The plant of Claim 19, wherein said altered fatty acid composition comprises from about 1.0% to about 10.0% linoleic acid and from about 1.0% to about 10.0% α -linolenic acid, based on total fatty acid composition.
- 23. A method for altering fatty acid composition in plant seeds, comprising the steps of:
 - a) introducing a recombinant nucleic acid construct into a plant, said construct comprising at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-12 fatty acid desaturase gene;
 - b) obtaining progeny from said plant, said progeny producing seeds having said altered fatty acid composition; and
 - c) producing seeds having said altered fatty acid composition.
 - 24. The method of Claim 23, wherein said construct comprises a full-length coding sequence of said mutant gene.
 - 25. The method of Claim 23, wherein said altered fatty acid composition comprises a decreased level of linoleic acid.
- 26. A method for altering fatty acid composition in 25 seeds, comprising the steps of:
 - a) introducing a recombinant nucleic acid construct into a plant, said construct comprising at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-15 fatty acid desaturase gene;
 - b) obtaining progeny from said plant, said progeny producing seeds having said altered fatty acid composition; and
 - c) producing said seeds having said altered fatty acid composition.

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- 27. The method of Claim 26, wherein said construct comprises a full-length coding sequence of said mutant gene.
- 28. The method of Claim 26, wherein said altered fatty acid composition comprises decreased levels of α -linolenic acid.
- 29. A recombinant nucleic acid construct effective for altering fatty acid composition in seeds, said construct comprising at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-12 fatty acid desaturase gene.
 - 30. A recombinant nucleic acid construct effective for altering fatty acid composition in seeds, said construct comprising at least one seed-specific regulatory sequence operably linked in sense orientation to a mutant delta-15 fatty acid desaturase gene.
 - 31. A vegetable oil extracted from seeds produced by the plant of Claim 1.
 - 32. A vegetable oil extracted from seeds produced by the plant of Claim 10.
 - 33. A vegetable oil extracted from seeds produced by the plant of Claim 17.
 - 34. A vegetable oil produced by the method of Claim 21.
- 25 35. A mutant delta-12 fatty acid desaturase comprising the amino acid sequence of SEQ ID selected from the group consisting of SEQ ID NO:4 and SEQ ID NO:8 or any mutant substantially similar thereto.
- 36. A nucleic acid fragment encoding the mutant 30 delta-12 fatty acid desaturase of Claim 35.